

Consider the common-emitter configuration for an NPN transistor, shown in Figure 1 below. Assuming $V_{CC} = 15\text{ V}$ for the configuration and that R_L is constant, use the transistor characteristics in Figure 2 to answer the following questions:

- What is the dependence of V_{CE} on I_C under the conditions of fixed V_{CC} and R_L ?
- The value of R_L is typically set in the design in such a manner that the load line representing the dependence of V_{CE} on I_C passes through the upper “knee” in the transistor characteristics curves shown in Figure 2. What is the appropriate value of R_L to make the line pass through the “knee”?
- The DC current I_B is normally set to make $V_{CE} \sim V_{CC}/2$. From the graph, at what value should the DC current be set?
- From the graph, what will be then the AC current gain for the configuration? The gain is $G = \Delta I_C / \Delta I_B$ along the load line.

